Microcontrollers 2° exam

Q1) Find the value of MYREG so as to have a delay time of 0.3504 ms. 20MHz

```
        MOVLW   [  ]H
        MOVWF   MYREG
again   Nop
        Nop
        Nop
        Nop
        Decf    MYREG,F
        BNZ     again
        return
```

Q2) a switch is connected to RC1, write a prog. to get the status of the switch and save it in D7 of filereg location 0X30.

Q3) assuming a system freq. of 10MHz, write a prog. to generate a square wave of 50Hz freq. on pin portB.7. use timer0, 16 bit, positive edge, with prescaler = 128.

Q4) for the following prog.

a) we want to use location 7 for COUNT.
b) what is the content of the following location in prog. memory.
4, 5, 6, 7, B, D

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```
LOC     OBJECT CODE   LINE   SOURCE TEXT
  VALUE



  00000007
  00000008

000000
000000 0E00                          MOVLW   0
000002 6E07                          MOVWF   COUNT
000004 EC06  F000            BACK    CALL    DISPLAY
000008 EF02  F000                    GOTO    BACK

                             ;——— increment and put it in PORTB
00000C 2A07                  DISPLAY INCF    COUNT,F        ;increment count
00000E C007  FF81                    MOVFF   COUNT,PORTB    ;send it to PORTB
000012 EC80  F001                    CALL    DELAY
000016 0012                          RETURN                 ;return to caller

                             ;——— this is the delay subroutine
000300
000300 0EFF                  DELAY   MOVLW
000302 6E08                          MOVWF   MYREG
000304 0000                  AGAIN   NOP     ;no operation wastes clock cycles
000306 0000                          NOP
000308 0000                          NOP
00030A 0608                          DECF    MYREG,F
00030C E1FB                          BNZ     AGAIN   ;repeat until MYREG becomes 0
00030E 0012                          RETURN                 ;return to caller
                                     END                    ;end of asm file
```

بسم الله الرحمن الرحيم

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[redacted]

متحكمات دقيقة الامتحان الثاني ٢/١٢/٢٠١٠

Q1 Freq: 20 MHz ⇒ $\frac{20}{4}$ = 5 MHz ⇒ T: 0.2 μs

(7 * x) + 1) 0.2 μs = 0.3504 ms

1.4 μs x + 0.2 μs = 0.3504 ms (12)

~~1.4 μs x = 0.3502 x~~

1.4 μs x = 0.3502 ms ⇒ x = 250 = H

MOVLW 250 H

Q2 D7 EQU 0X30

~~BSF~~

~~port~~ C EQU F82H

TRISC EQU F94 H

BSF TRISC,1

BCF D7,0X30 (4)

~~BSF~~

BTFSS PORTC,1

MOVWF D7,0X30

~~BTFSS goto here~~

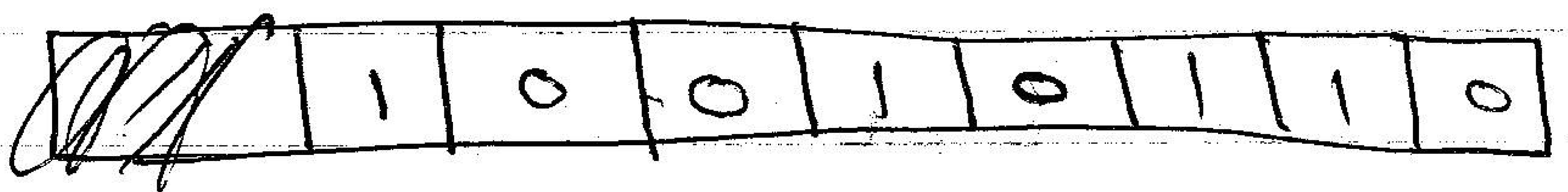
~~BTFSC~~

MOVWF D7,0X30

END

0 0 0 2
0 0 1 4
0 1 0 8
0 1 1 16
1 0 0 32
1 0 1 64
1 1 0 128
1 1 1

Q3 | freq = 10MHz



$\frac{10MHz}{4} = 2.5MHz \Rightarrow T = \frac{1}{2.5MHz \times 128} = ~~0.4 \mu s~~ = 3.125 \mu s$

F square wave = 50 Hz $\Rightarrow 50Hz = \frac{1}{2T} \Rightarrow T = \frac{1}{100Hz} = 0.01$ ~~ms~~ s =

$\Rightarrow$ FFFF - initial = ~~d~~ no. of loop

$\frac{0.01}{0.4 \times 10^{-6}} = 25000 \Rightarrow$ FFFF - ~~25000~~ 3200 = no. of loop

65536 - 25000 = ~~40536~~ 62336

62336 | 15
~~40536~~ | 18
8
~~3~~ F

40536 → to hexa ⇒ 8

F380
~~9E58~~

now programming

```
TRISB    EQU   F93H
portB.7  EQU   F81H
         BCF   TRISB,7
again    BSF   PortB,7
         call  delay
         BCF   Port B7
         go to again
```

delay

```
start    BSF    Tocon, TMR0on
         BCF    INTCON, TMR0IF
         MOVLW  X80
         MOVWF  TMR0L
         MOVLW  XF3
         MOVWF  TMR0H
         BSF    Tocon, TMR0on
again    BTFSS  INTcon, TMR0IF
         go to  again
         BCF    To con, TMR0n
         go to  start
```

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Q4-

(a) Count EQU 0X7

(b)

1- location 4 Contains EC

2- Location 5 Contains 06

3- Location 6 Contains F0

4- Location 7 Contains 00

5- Location B Contains 00

~~6-2~~

~~6- Location D Contains 07.~~

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0004	EC
0005	06
0006	F0
0007	00
0008	EF
0009	02
00A	F0
00B	00
00C	2A
00D	07